

# Vladimir Kostyukov

## Compiler Engineer

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## Summary

*Software Engineer* with 3 years of experience developing compilers and VMs. Creative and passionate programmer with in-depth knowledges of managed runtimes and compilers. Excellent Java and C/C++ programming skills allied with experience in performance analysis and benchmarking.

## Skills

<b>Programming Languages</b>	Fluent in <i>Java</i> and <i>Scala</i> Efficient in <i>C/C++</i> Knowledges in <i>JavaScript</i> , <i>Python</i> , <i>Perl</i>
<b>Scopes</b>	Programming Languages Design and Implementation, Performance Analysis, Object Oriented Programming, Functional Programming, Purely Functional Data Structures, Design and Analysis of Algorithms

## Experience

2011/04 – ... **Software Engineer**, [Intel Corporation](#), Novosibirsk, Russia.

I am a member of the **Managed Runtimes** team. My first project there was development (from scratch) a proof of concept PKCS#11 Java Crypto Provider (5k LOC), which based on Intel IPP libraries. The developed prototype showed 6X speedup relative to the default Java implementation.

I am currently involved into development of the x86 Trace-JIT compiler (targeted to Intel<sup>®</sup> Atom™ Architecture) for Dalvik VM. More precisely, I am responsible for development of both back-end (including code generation and instruction scheduling) and middle-end (including data-flow analysis and optimizations on CFG) components of the compiler.

**Tools:** *Linux Shell*, *Git*, *Gerrit*, *Bugzilla*, *GCC*, *Intel VTune*, *Intel TBB*, *Intel IPP*

**Keywords:** *Performance Analysis*, *Compilers and Interpreters*, *JIT Compilation*, *Low-Level and High-Level Optimizations*, *Data-Flow Analysis*, *CFG Construction and Analysis*, *Instruction Scheduling*, *Registerization*, *Benchmarking*, *Debugging*

2010/10 – 2011/04 **Software Intern**, [Intel Corporation](#), Novosibirsk, Russia.

As a member of **Compilers and Languages** group I was responsible for performance tracking and analysis of Intel Compiler for MIC platform (a GPU/GP chip with up to 128 cores). I gained an Intel SSG Award for being a pioneer of Intel MIC compiler performance tracking (developed a Perl-based harness and ported initial four workloads from NVidia CUDA SDK).

**Tools:** *Intel Compiler Collections*, *Perl*, *Intel VTune*, *Linux Shell*

**Keywords:** *Performance Analysis*, *GPU Offload*, *Benchmarking*, *Multithreading and Concurrency*, *Synchronization*, *Parallel Algorithms*, *Lock-Free Algorithms*

2010/07 – 2010/08 **Summer School Intern**, [Intel Corporation](#), Novosibirsk, Russia.  
I was working in **Java Xeon** team on the analysis of bottlenecks in the SPECjvm2008.serial test at Intel's modern architectures. The suggested solution (based on reducing number of stack frames) showed up to 50% speedup on WSM-EX platform (in a multithreaded mode).  
**Tools:** *Linux Shell, JDK, GCC, Intel VTune, Vim, SPECjvm2008, Eclipse*  
**Keywords:** *Java Performance Analysis, Benchmarking, Concurrency, JMM, JVM Internals, Serialization*

2007/10 – 2010/07 **Technician**, [Altai State Technical University](#), Barnaul, Russia.  
While working in IT department, I was responsible for maintaining network environment of university campus. I also was leading a technical support team of ACM ICPC NEERC.  
**Tools:** *Linux Shell, Clonezilla*  
**Keywords:** *Scripting, OS Cloning, Network Administration*

## Projects

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la4j **Linear Algebra for Java**, <http://la4j.org>.  
The la4j is a lightweight and 100% Java library that provides Linear Algebra primitives and algorithms. It is highly popular sparse/dense matrix library, which combines both fluent API and good performance.  
**Tools:** *Java SE, Eclipse, Maven, junit, Git, Travis-CI*  
**Keywords:** *Linear Algebra, Math, API Design, TDD, Design Patterns, Open Source*

Quipu **Quipu Programming Language**, <http://esolangs.org/wiki/Quipu>.  
The Quipu is an Esoteric programming language inspired by «talking knots» – recording devices historically used by Incas. It is a «believed Turing-complete» language, which means author believes that the language is Turing-complete, but no formal proof was provided.  
**Tools:** *Scala*  
**Keywords:** *Source Code Parsing, Interpretation*

## Papers

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**Functional Programming** A Functional Approach to Standard Binary Heaps, 2013, [arXiv:1312.4666](https://arxiv.org/abs/1312.4666).

## Education

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2006 – 2011 **Master of Science** in CS, [Altai State Technical University](#), Barnaul.  
Master's thesis: *"Distributed monitoring and dispatching system of the processes in heterogenous environment"*.  
Grade: 95/100

## Certificates

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2010 **IPPP-2-12**, Intel Parallel Programming Professional.  
2010 **HPC School 2010**, Participant Certificate.  
2010 **Intel Summer School 2010**, Participant Certificate.  
2010 **Intel Winter School 2010**, Participant Certificate.